DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

WORKING PAPER

SMALLHOLDER MAIZE PRODUCTION AND SALES IN ZIMBABWE:
SOME DISTRIBUTIONAL ASPECTS

by

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Working Paper AEE 2/89

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January 1989

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Introduction

The most significant change in Zimbabwe's agricultural sector over the past six years is the increasing importance of smallholder farmers in the production and marketed surplus of maize, the country's major food crop.[1] Over the period 1980-1986, smallholder maize production more then tripled. By 1986, these farmers accounted for over one half the country's total maize production. A large proportion of the production gains were delivered to the Grain Marketing Board. As a result, smallholder contribution to marketed surplus grew from 8% in 1979 to some 43% of total deliveries by 1986.[2] A combination of factors explain this dramatic upsurge in the smallholder's share of marketed maize output including the ending of the independence war, increased producer prices and availability of suitable maize technology. Government post-independence efforts to redress the balance in access to agricultural services such as extension, credit and marketing on the part of the smallholder farmer also played an important role.[3]

Zimbabwe is widely regarded as an agricultural success story, but agricultural development has not benefited all segments of the smallholder sector equally. The provincial distribution of increases in smallholder maize output and sales over the period 1980-1985 exhibit considerable disparities across regions, with the largest gains occurring in the regions of high-to-medium agroecological potential (Table 1a and 1b).[4] This concentration was even more marked in the drought years of 1982

Table 1A: Marketed Maize Output by Communal and Smallscale Farming Sub-sectors by Province, 1980-1985

Province	Harvest Year (tonnes)						% 1985 Total	% Output Growth 1980-1985	Average 1980-1985 (tonnes)	Standard Deviation 1980-1985	kg per Capita in 1985
	1980	1981	1982	1983	1984	1985					
Manicaland	9,765	38,349	32,261	3,597	24,612	69,845	8.4	22.3	29,738	(23,654)	113
Mashonaland Central	14,121	65,407	87,492	46,340	91,922	133,990	16.1	33.3	73,214	(41,289)	584
Mashonaland East	19,033	61,885	111,312	29,686	96,268	170,311	20.5	31.3	81,416	(56,508)	432
Mashonaland West	22,282	86,211	83,700	66,729	106,825	162,245	19.5	29.2	87,999	(46,173)	740
Matabeleland North	180	3,319	1,320	913	13,373	33,911	4.1	85.6	8,836	(13,221)	121
Matabeleland South	1,202	3,833	2,464	846	1,662	5,907	0.7	12.5	2,653	(1,916)	19
Midlands	12,838	68,035	32,547	2,176	46,033	141,777	17.0	23.2	50,568	(50,467)	252
Masvingo	5,959	33,001	11,411	20	47,807	110,287	13.2	26.7	34,748	(41,132)	170
Miscellaneous	2,041	3,234	3,911	5	4,188	4,392	0.5	-	2,962	(1,680)	-
Total	87,421	363,274	366,418	150,312	432,690	832,674	100.0	31.1	-		-

Source: Computed by author from district totals derived from Grain Marketing Board's annual records.

Notes: 1. Miscellaneous, includes all marketings not allocated to a specific district. 2. Population figures used to determine per capita marketed output are derived from the 1982 population census of Zimbabwe. The estimated population growth rate in each province was used to derive population estimates for 1985.

Table 1b: Provincial Distribution of Communal and Smallscale Farming Sector by Natural Region.

Province	% Area by Natural Region				
	I	IIa & IIb	III	IV	V
Manicaland	5.3	19.5	6.1	65.1	4.0
Mashonaland Central	-	18.0	20.1	61.9	-
Mashonaland East	-	39.9	7.5	52.6	-
Mashonaland West	-	47.9	24.5	10.8	17.0
Matabeleland North	-	-	2.6	68.5	28.9
Matabeleland South	-	-	-	39.1	60.9
Midlands	-	16.4	47.2	34.8	1.6
Masvingo	-	-	12.5	55.0	32.5

Source: Computed by author from information provided by the Crop Production and Topographer Sections, Department of Agricultural, Technical and Extension Services, Harare, Zimbabwe.

Note 1: Zimbabwe is divided into five Natural Regions on the basis of soil type, rainfall and other climatic factors. The first three regions are suitable for intensive crop and livestock production, whereas the remaining two offer limited scope for agriculture and are best suited to extensive livestock production.

and 1983. There is a danger in Zimbabwe of regarding the growing importance of smallholder producers in the marketed surplus of maize as evidence of a generally viable peasant sector, capable of providing all its members with adequate food and a reasonable standard of living. Households in typically low rainfall areas have benefitted least from Zimbabwe's broadly focussed agricultural development strategy and there is now a pressing need to identify low cost technologies suited to marginal rainfall areas.

The discovery that smallholders benefiting from, and responding to, the increase in support services and market opportunities are situated in the higher rainfall zones, is to be expected - since improved maize technologies were developed for and are best suited to these regions. However, a further issue of interest is, to what extent have expanded market opportunities had a differential impact on different groups of producers within a given major grain producing region. A growing literature on the existence of socioeconomic differentiation among rural households teaches us to be critical of suggestions that rural producers are homogenous, with equal opportunities and abilities to respond to agricultural development strategies. Previous research has accounted for differentiation of rural producers in terms of commoditisation and commercialisation in agrarian societies, the domestic development cycle of households, and the urban biased nature of development policy.[5] A study of social differentiation in Botswana showed evidence of considerable horizontal stratification within rural

areas arising primarily from cash incomes or remittances derived from the formal sector which were then invested in livestock and arable production.[6] Chayanov's concept of the cyclical development of the family economy also points to the possibility of inequality in the peasant economy which is demographic in origin.[7] With regard to this proposition, Hill concludes her comparative study of dry grain farming families in West Africa and India by noting that poverty is the natural condition of the younger household heads.[8] Although these processes of rural differentiation cannot be directly transported to the Zimbabwe situation, there is no a priori reason to expect homogenous circumstances within Zimbabwe's communal areas. This is supported by observers of the Zimbabwe food problem who point to the apparent paradox of widespread hunger and poverty in the rural areas and a simultaneous growing marketed surplus coming from within the peasantry.[9]

This paper further explores the characteristics of the distribution of maize production and sales in the smallholder subsector by examining the concentration and spread of maize transactions and income flows amongst rural producers in one of Zimbabwe's high-to-medium potential communal farming areas - noted for its post-independence expansion in maize production and sales. It is hypothesised that the distribution of production and sales gains is skewed in favour of producers with the greatest resource endowments.

The survey area is Hurungwe communal land, a grain surplus area in Mashonaland West, 260 km northwest of Harare. Annual

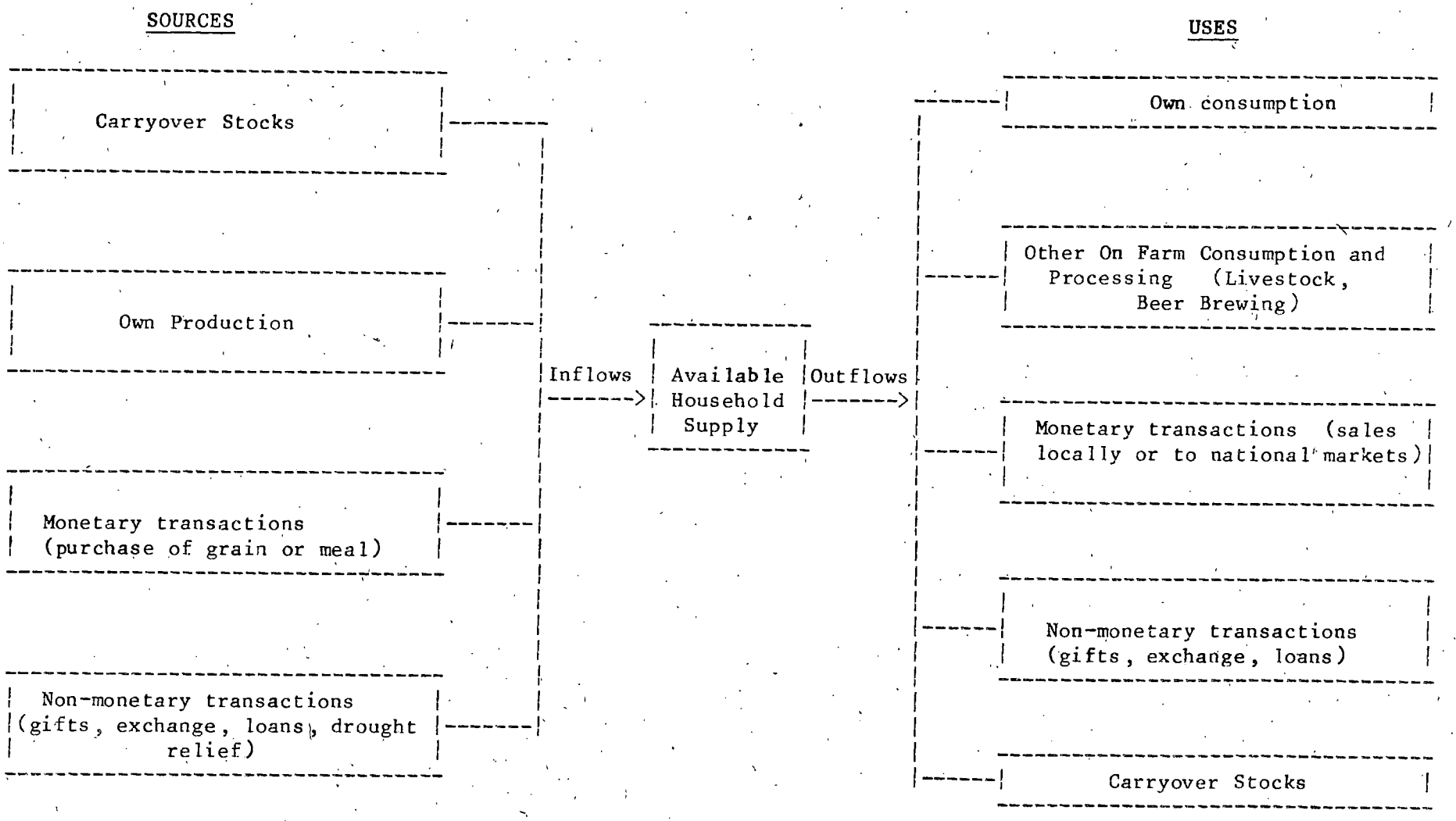
rainfall in the area is between 600-800mm and soils are mainly moderately shallow sandy loams. Some parts of the region have been settled for a long period, but Hurungwe has, in recent years, experienced considerable in-migration of families from areas of land pressure in other parts of Zimbabwe. Mean land holding size per household is around 4 hectares and households support 6-8 persons on average. Maize is the dominant staple food crop as well as a major cash crop - it occupies over 90% of the area under grain crops in this region and accounts for some 70% of the total cultivated area. Other cash crops grown include cotton and oiseeds. Hurungwe is well served by marketing facilities, including two permanent depots and a number of seasonal collection points. Mean distance to market for households marketing maize in 1985 was 34 km. The analysis is based on monthly enumeration of some 80 households over the period June 1985 to May 1986. Information collected included grain flows and storage patterns, income flows and related variables such as household characteristics and resource endowments.

Maize Transactions by Farm Households

Producer Maize Transactions

Farm household maize transactions involve both inflows and outflows (Figure 1). Sources of maize include own production, purchase of maize grain or meal, non-monetary transactions and carryover stocks. Non-monetary transactions include exchange of

FIGURE 1 - MODEL OF FARM HOUSEHOLD GRAIN TRANSACTIONS



services such as labour and commodities such as cooking-meat for grain. Carryover stocks are of negligible importance in regions of Zimbabwe where hybrid maize is the staple since this grain rapidly deteriorates if stored beyond 11-12 months under village conditions.

In aggregate terms, sample households were self-sufficient in maize during the survey period with own production accounting for over 90% of total maize available (Table 2). The balance of requirements was made up through non-monetary transactions (8%) and purchases of maize grain (0.75%) and maize meal (0.25%).

Households in this part of Zimbabwe use maize for both human consumption and for feeding livestock (particularly pigs). Maize is also used for non-food purposes such as beer brewing and in exchange for goods and services. Surplus maize is sold either locally or to the Grain Marketing Boards, a parastatal marketing agency.

During the survey period collectively households had a large surplus of maize (Table 2). Retentions of maize for home consumption accounted for only 13% of available supplies. Some 75% of maize was marketed, over 90% of which was purchased by the Grain Marketing Board. The use of maize for other on-farm consumption and non-monetary transactions was together almost as significant as home consumption in terms of its total share of maize disposal. This suggests that decisions about on-farm retentions are not based on household food demand alone.

Table 2: Farm Household Maize Transactions, Hurungwe District, Zimbabwe (June 1985 - May 1986)

MAIZE TRANSACTION	Quantity (tonnes)			
	Total	Mean (n=78) 1/	Per capita	Sum %
SOURCES				
Own production	497.0	6.37	0.90	91
Monetary Transactions 2/	5.7	0.08	0.01	1
Non-monetary transactions	42.1	0.54	0.08	8
TOTAL	544.8	6.99	0.99	100
USES				
Own consumption	73.1	0.94	0.13	13.4
Monetary transactions	407.0	5.22	0.74	74.7
Other on-farm consumption and processing	22.3	0.29	0.04	4.1
Non-monetary transactions	42.4	0.54	0.08	7.8
TOTAL	544.8	6.99	0.99	100

Notes:

1/ Only 78 households were included in the calculation of the table due to missing data for some households.

2/ Maize Meal was converted to a grain equivalent using a conversion factor of 1.16.

Source: Computed from food grain survey, June 1985 - May 1986, Hurungwe District, Zimbabwe.

Maize Transaction Categories by Farm Type

The distributional characteristics of maize transactions can be examined by categorising producers by types of transactions. Net maize transactions over the period June 1985 - May 1986 are the basis of classification (Table 3). More than 85% of the Hurungwe sample were net maize surplus households in 1985-86, although transaction levels per household varied widely. The top 10% had a mean surplus in excess of 170 bags (15 mt). The

Table 3: The Distributional Structure of Maize Transactions in Hurungwe District, June 1985 - May 1986, Zimbabwe

Net of all maize Transactions made by Household 1/ (91 kg bags)		% Farms	Net Mean Maize Transactions 2/ (91 kg bags)			% Share Marketing	% Share Purchases	% Share Production
			Total	Monetary	Non-Monetary			
> 200 bags (>18.3mt)	out	4.5	345.3	343.6	1.7	23.3	0.0	20.1
151 -200 bags (13.7-18.2mt)	out	9.0	169.3	170.4	- 1.1	23.1	0.0	20.4
101 -150 bags (9.2-13.6mt)	out	16.4	113.5	110.6	2.9	27.5	0.0	25.9
51 -100 bags (4.6- 9.1mt)	out	12.0	74.9	80.5	- 5.6	14.6	6.0	13.6
26 - 50 bags (2.4- 4.5mt)	out	17.9	35.2	29.2	6.0	8.0	6.6	10.3
5 - 25 bags (0.45- 2.3mt)	out	19.4	14.3	10.6	3.7	3.4	35.3	6.8
< 5 bags (0.45mt)	out	9.0	2.3	- 0.9	3.2	0.0	15.4	1.5
No Transactions		0.0	-	-	-	-	-	-
< 5 bags (0.45mt)	in	8.8	- 1.5	- 0.9	- 0.6	0.1	21.7	1.1
> 5 bags (0.45mt)	in	3.0	-5.75	- 2.9	- 2.8	0.0	15.1	0.3

Notes:

1/ Includes monetary and non-monetary transactions; but excludes on-farm consumption, non-food consumption and storage which are not transactions - although they will influence level of transactions.

2/ Positive sign indicates maize sold or disposed of in a non-monetary transaction, negative sign indicates maize purchased or received from other sources.

Source: Data from Food Grain Study, Hurungwe Distict, Zimbabwe

bottom 40% had a mean surplus of less than 15 bags (1.4 mt). A core of 30% of households accounted for around three-quarters of the marketed surplus. In contrast, just under 60% of households accounted for 12% of total quantity of maize marketed.

Although only a small proportion (12%) of households experienced net deficits in the 1985-86 season, a significant proportion of households (28%) traded less than 25 bags (2.2 mt) of maize. This suggests that they are vulnerable to a shortfall of maize in a less favourable season. Some of those households actually purchased maize during 1985-86, although the level of purchases was small in relation to total requirements. When this group of marginal surplus producers is added to the net deficit households, they together account for 40% of the sample population.

A strong association exists between net maize transaction level, per capita availability of maize, and key output-related variables such as maize area, farm size and availability of draft power[10], (Table 4). This suggests that the distribution of productive assets is an important variable accounting for the basic difference, amongst households in their response to market opportunities.

Purchased inputs such as fertilizer also infuence production levels. The use of chemical fertilizer on maize is quite widespread in Zimbabwe and 70% of sample households applied fertilizer to their maize crop. Although details on actual

Table 4: Correlations among household net maize transactions and various household characteristics, Hurungwe District, Zimbabwe

	Maize Production per capita	Maize Area	Farm Size	Number of Cattle	Number of H/H members living on farm	Age of H/H Head
Net maize transactions made by household	** 0.54	** 0.58	** 0.56	** 0.52	* 0.34	0.06

Source: Data from food grain study, Hurungwe District, Zimbabwe

Notes: 1 tailed significance = * 0.01, ** 0.001.

level of fertilizer use are not available, there is evidence that marginal producers are using less fertilizer than surplus producers since 50% of farmers who were either deficit producers or had a net surplus of less than 5 bags of maize, used fertilizer, whereas all the farmers who traded more than 100 bags of maize applied fertilizer.

Farm Household Income Flows[11]

Level and Source of Cash Income

Further evidence on the differentiation among survey households is provided by examining the nature of farm and non-farm income flows contributing to the household economy. This analysis is based on gross cash income flows.

The average household income from all sources over the survey period, averaged Z$ 1640 (Table 5). Farm production accounted for around 60% of total monetary income, but remittances were also an important income category.

Table 5: Income Structure of Farm Households, June 1985 - May 1986, Hurungwe District, Zimbabwe

Income Source	% HH with Source	% of Total Income	Mean income from Source (Z$)
Grain Income	79	30.5	499
Remittances	88	16.9	276
Other Crop Income	88	16.1	263
Livestock Income	86	12.2	200
Local Business 1/	8	9.6	158
Local Off-farm Wage	64	7.0	115
Home Industry	36	1.2	23
Other	69	6.3	104
MEAN INCOME			1 638

Note 1/: Net Profit
Source : Derived from monthly income survey, Hurungwe District, Zimbabwe.

The share of gross cash income across percentile groups indicates marked inequality in the distribution of incomes (Table 6).

Table 6: Percentage Share of Gross Cash Income by Percentile Groups, June 1985-May 1986, Hurungwe District, Zimbabwe

	Lowest 25%	Second Quartile	Third Quartile	Highest 25%	Highest 10%
Gross Cash Income	6.2	14.0	22.9	56.9	36.0

Source: Derived from monthly income survey, Hurungwe District, June 1985 - May 1986, Zimbabwe

Maize Transaction Categories by Income Flow

The dominance of farm production in generating cash income suggests that households with higher net maize surpluses will exhibit higher income flows. This is generally confirmed when maize transaction categories are examined alongside income flows (Table 7). Net deficit households and those with a net surplus of less than 50 bags (4.5 mt) had below average cash incomes. There was also a tendency for these households to receive a larger share of cash income from off-farm sources. The steady increase in the relative contribution of remittances to cash income, as net maize transactions and mean income level declines, is particularly striking.

An examination of the relationship between income categories and farm type lends support to the hypothesis that families with larger income flows are those with better resource endowments (Table 8). Households receiving the lowest cash incomes were labour poor households operating below average size holdings and owning few cattle. An interesting relationship is observed between the incidence of absentee household heads, proportion of households with at least one family member working away from home and cash income categories. Low income households had a higher incidence of absentee household heads than households with higher levels of cash income. On the other hand, households with incomes in excess of $ 2000 per annum showed the highest incidence of having another family member in urban employment.

Table 7: Maize Transaction Category and Gross Cash Income Flows by Source, June 1985 - May 1986, Zimbabwe

Net of all maize Transactions made by Household (91 kg bags)	% Farms	% Income	Mean Income Z$	Income Source (% Share)								Income Source (% Share)	
				Grain	Other Crops	Live-stock	Remit-tances	Local off-farm wage	Home in-dustry	Local Busi-ness	Other	Farm	Off-Farm
> 200 bags out	4,5	22,2	8620	49,6	7,4	0,7	3,7	0,2	0,3	33,4	4,7	57,7	42,3
151 - 200 bags "	9,0	14,6	2833	53,4	11,9	6,9	11,3	12,4	1,0	0,0	3,1	72,2	27,8
101 - 150 bags "	16,4	16,9	1792	33,2	18,5	17,8	20,2	1,4	1,9	0,0	7,0	69,5	30,5
51 - 100 bags "	12,0	16,3	2374	18,6	25,7	10,8	16,9	3,0	0,8	21,0	3,2	55,1	44,9
26 - 50 bags "	17,9	7,4	720	25,3	14,6	12,4	24,0	10,8	6,7	0,0	6,2	52,3	47,7
5 - 25 bags "	19,4	13,8	1323	15,9	20,9	22,4	24,6	8,6	2,0	0,0	5,6	59,2	40,8
< 5 bags "	9,0	4,3	840	0,1	22,5	18,6	31,3	14,5	5,4	0,0	7,6	41,2	58,8
< 5 bags in	8,8	3,4	651	4,9	18,3	16,9	31,0	15,0	17,1	0,0	8,3	40,2	59,8
> 5 bags "	3,0	1,1	607	0,0	5,0	2,9	33,1	54,1	4,9	0,0	0,0	7,9	82,1

Source: Derived from monthly food grain and income survey, Hurungwe District, June 1985 - May 1986, Zimbabwe

Table 8: Income Categories According to farm Type, Hurungwe District, June 1985 - May 1986, Zimbabwe.

Gross Cash Income $	% Farms	Mean Farm Size (ha's)	Mean No. of H/H members living on farm	Mean No. of cattle	% farms with H/H head absent	% farms with at least 1 family member in employment
< 500	14.1	3.9	6.8	1	0.0	10.0
501-1000	25.6	2.6	5.5	2	21.1	27.0
1001-1500	25.6	4.1	5.7	7	11.8	29.8
1501-2000	12.8	4.0	7.3	9	40.0	40.0
2001-2500	6.3	4.1	9.8	10	0.0	30.2
2501-3500	5.0	7.7	9.8	21	0.0	100.0
3501-4500	5.0	8.1	11.8	14	24.0	62.0
4501 <	5.0	6.3	14.5	27	0.0	0.0

Source: Data from Food Grain and Income Study, Hurungwe District, Zimbabwe.

The phenomenon of household heads from low income, resource poor households having a greater likelihood of being absent in wage employment can be explained by the comparative advantage of wage employment over farming in these circumstances. Households with better resource endowments have a higher potential for generating productive and remunerative on-farm employment for more household members and therefore the need to supplement earnings through off-farm employment is less pressing. On the other hand, if households in this category are older, mature households, they are able to exploit off-farm income opportunities through other household members such as adult sons

and unmarried daughters. This appears to be the case amongst resource-rich sample households in Hurungwe and supports findings from previous surveys in Southern Africa.[12] Further analysis of available data on remittances and off-farm employment will provide a clearer picture of linkages between the rural household economy and formal sector employment for different categories of farm households.

Conclusions and Policy Implications

The preceding sections examined the level and characteristics of household maize transactions and income flows of sample farmers in one of Zimbabwe's most productive communal areas. While the breadth of the sample - in terms of the universe of communal areas - is inevitably narrow, the study provides an opportunity to investigate some of the policy issues associated with the emergence of the communal farmer as an important contributor to marketed surplus.

The analysis shows that even within a communal area favourable for maize production, having good market infrastructure and established acceptance of improved maize technology there is marked inequality in the distribution of both maize surplus and cash incomes. A core of 30% of households accounted for around 75% of marketed maize. The lowest 25% of producers controlled less than 4% of marketed maize and only 7% of monetary income.

Some 40% households were either net deficit households or marginal surplus producers and risk food deficits in a less favourable season.

The significant contribution of remittances and non-farm sources to monetary income, particularly in marginal and maize deficit households, shows that off-farm employment is important in contributing to family food security.

Zimbabwe is committed to a development policy of growth with equity, but faces a conflict between allocating scarce resources (extension agents, credit, market infrastructure, etc.) to the better-off communal farmer who produces the bulk of the agricultural surplus essential to the development of the economy; or to spreading these resources over a broader spectrum of farmers and reducing the marketed surplus. The expansion of off-farm employment in rural areas could overcome some of the conflicts involved in concentrating agricultural services on the poorest and least responsive producers.

[1]Zimbabwe's agricultural sector encompases a large-scale commercial sub-sector (15m ha's) and a smallholder sub-sector incorporating the communal areas (16.3m ha's), smallscale commercial lands (1.5 m ha's) and resettlement areas (1.5m ha's).

[2]Central Statistical Office, Statistical Yearbook 1985, Harare, Zimbabwe; J.L. Stanning, 'Contribution of Smallholder Agriculture to Marketed Output in Zimbabwe 1970 - 1985 : Recent Experience and some future research issues.' Department of Agricultural Economits and Extension, University of Zimbabwe, Working Paper 5/85. 1985.

[3]J.L. Stanning, op cit Ref 2; and D.D. Rohrbach 'A preliminary Assessment of Factors Underlying the Growth of Communal Maize Production in Zimbabwe' in C.K. Eicher and M. Rukuni, eds, Food Security for Southern Africa, University of Zimbabwe/Michigan State University Food Security Project. Department of Agricultural Economics and Extension, University of Zimbabwe, 1987, pp 145-215.

[4]J.L. Stanning 'Household Grain Storage and Marketing in Surplus and Deficit Communal Farming Areas in Zimbabwe - Preliminary Findings' in C.K. Eicher and M. Rukuni, eds, op cit, ref 3, pp 245-291.

[5]J. Harriss, ed. Rural Development : Theories of Peasant Economy and Agrarian Change, Hutchinson University Library, 1982, pp 15-33.

[6]C. Murray, 'Migrant Labour and Changing Family Structure in the Rural Periphery of Southern Africa', Journal of Southern African Studies, Vol. 6, No. 2, 1980.

[7]A.V. Chayanov, The theory of Peasant Economy, D. Thorner et al, ed. Homewood : Richard D. Irwin, 1966.

[8]Polly Hill, Dry Grain Farming Families : Hausaland (Nigeria) and Karnataka (India) Compared, Cambridge University Press, 1982.

[9]J.C. Jackson, P. Collier and A. Conti, Rural Development and Food Security in Zimbabwe : Part II, Rural Employment Policies Branch, Employment and Development Department, International Labour Office, Geneva, 1987.

[10]Maize technology research in Zimbabwe shows that those farmers with cattle have better land preparation, earlier planting and weed control, apply manure, and achieve better crop yields. See, Shumba E. (1985), A Diagnostic Survey of Mangwende Communal Area, Zimbabwe, for On-farm Research Planning, Research Report No. 6, Research and Specialist Services, Harare.

[11] Z$1.00 = US$0.60 = Pounds stg. 0.32, January 1987.

[12]A. Low, Agricultural Development in Southern Africa: Farm - Household Economics and the Food Crisis. London : James Curry Ltd., 1986, pp 78.